

WHAT IS CLAIMED IS:

1. A method of fabricating a steel part by forging, the method being characterized by the following steps:

- preparing and casting a steel having the following
5 composition in percentages by weight: $0.06\% \leq C \leq 0.35\%$;
 $0.5\% \leq Mn \leq 2\%$; $traces \leq Si \leq 2\%$; $traces \leq Ni \leq 1.5\%$;
 $traces \leq Al \leq 0.1\%$; $traces \leq Cr \leq 1.5\%$; $traces \leq Mo \leq$
 0.30% ; $traces \leq V \leq 0.5\%$; $traces \leq Cu \leq 1.5\%$; the
remainder being iron and impurities that result from
10 preparation;
· forging a blank for the part at a temperature in
the range $110^{\circ}C$ to $1300^{\circ}C$:
· cooling the blank for the part in controlled
manner in still or forged air at a speed less than or
15 equal to $3^{\circ}C/s$ in the range $600^{\circ}C$ to $300^{\circ}C$, thereby
imparting a bainite microstructure to the blank;
· machining the part; and
· performing a mechanical reinforcing operation on
the part at locations that are to be subjected to
20 particularly high levels of stress.

2. A method according to claim 1, wherein the steel contains 5 ppm to 50 ppm of B.

25 3. A method according to claim 1, wherein the steel contains 0.005% to 0.04% of Ti.

① 4. A method according to claims 2 and 3 taken together,
wherein the steel contains 0.005% to 0.04% of Ti, and
30 wherein the Ti content is equal to not less than 3.5
times the N content of the steel.

5. A method according to claim 1, wherein the steel contains 0.005% to 0.06% of Nb.
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6. A method according to claim 1, wherein the steel contains 0.005% to 0.2% of S.

7. A method according to claim 6, wherein the steel contains at least one of the following elements: Ca up to 0.007%; Te up to 0.03%; Se up to 0.05%; Bi up to 0.015%;
5 and Pb up to 0.15%.

8. A method according to claim 1, wherein the C content of the steel lies in the range 0.06% to 0.20%.

10 9. A method according to claim 8, wherein the Mn content of the steel lies in the range 0.5% to 1.5%, and wherein the Cr content lies in the range 0.05% to 1.5%.

15 10. A method according to claim 8, wherein the Cu content of the steel lies in the range 0.5% to 1.5%.

11. A method according to claim 1, wherein the C content of the steel lies in the range 0.25% to 0.35%, the Si content lies in the range traces to 0.5%, the Mn content
20 lies in the range 0.8% to 2%, the Cr content lies in the range 0.5% to 1.5%, the Mo content lies in the range 0.05% to 0.20%, the B content lies in the range 5 ppm to 50 ppm, and the Ti content lies in the range 0.005% to 0.04%.

25 12. A method according to claim 1, wherein the C content of the steel lies in the range 0.20% to 0.35%, the Si content lies in the range 0.5% to 2%, the Mn content lies in the range 0.8% to 2%, the chromium content lies in the
30 range 0.5% to 1.5%, the molybdenum content lies in the range 0.05% to 0.20%, the boron content lies in range traces to 50 ppm, and the Ti content lies in the range 0.005% to 0.04%.

35 13. A method according to claim 12, wherein annealing is performed in the range 300°C to 500°C for a period of 1 h

to 3 h after machining or after controlled cooling in air and prior to machining.

14. A method according to claim 1, wherein the mechanical
5 reinforcing operation is burnishing.

15. A steel forging, obtained by the method according to claim 1.

10 16. A steel forging according to claim 15, constituting a crank shaft for an IC engine.

17. A steel forging according to claim 16, wherein the
15 mechanical reinforcing operation is performed on the fillets connecting the crank pins and the bearings of the crank shaft.